

Claims

1. A suturing instrument comprising:
 1. an elongate body member;
 2. a needle deployment system disposed at a distal portion of the elongate body member, the needle deployment system comprising a forward-deploying needle carrier; and
 3. a catch disposed on the elongate body member to receive and retain the needle.
2. A suturing instrument as defined in claim 1, further comprising a deployment controller having a distal end, the deployment controller extending substantially along a longitudinal axis of the elongate body member to the distal portion of the elongate body member where the distal end of the deployment controller being coupled to the needle carrier to facilitate movement of the needle carrier between a retracted position and a deployed position.
3. A suturing instrument as defined in claim 2, further comprising an actuator coupled to a proximal end of the deployment controller.
4. A suturing instrument as defined in claim 2, wherein the deployment controller is configured to guide the needle carrier along a path that comprises a proximal curved path segment leading initially away from the elongate body member and then towards the elongate body member.
5. A suturing instrument as defined in claim 1, further comprising a second needle carrier.
6. A suturing instrument as defined in claim 1, further comprising a suture with an attached needle.
7. A suturing instrument as defined in claim 6, wherein the needle inserts into the needle carrier.
8. A suturing instrument as defined in claim 1, wherein the catch is positioned on the elongate body member such that a distal path segment of the needle carrier's path is intercepted by the catch.

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A10 1 9. A suturing instrument as defined in claim 2, further comprising a flexible drive member
2 coupling the deployment controller to the needle carrier

1 10. A suturing instrument as defined in claim 9, wherein the flexible driver member
2 comprises an alloy including nickel and titanium.

1 11. A suturing instrument as defined in claim 1, wherein the needle carrier and needle catch
2 are located in a distal tip assembly coupled to the elongate body member such that the distal tip
3 assembly is free to rotate axially about a longitudinal axis with respect to the elongate body
4 member.

1 12. A suturing instrument as defined in claim 1, wherein the needle carrier and needle catch
2 are located in a distal tip assembly coupled to the elongate body member at a pivot joint such that
3 the distal tip assembly is free to deflect about the pivot joint.

1 13. A method for placing a suture in tissue comprising the steps of:

2 placing a suturing instrument enclosing a forward-deploying needle carrier including a
3 needle, wherein the forward-deploying needle carrier is movably positioned within a needle
4 carrier channel adjacent the tissue to be sutured;

5 deploying the forward-deploying needle carrier out of the suturing instrument through a
6 forward-directed exit port; and

7 capturing the needle carried by the forward-deploying needle carrier in a catch that
8 receives and retains the needle.

1 14. The method of claim 13, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating a deployment
3 controller, the deployment controller having a distal end and extending substantially along a
4 longitudinal axis of an elongate body member to the distal portion of the elongate body member,
5 the distal end of the deployment controller being coupled to the needle carrier to facilitate
6 movement of the needle carrier between a retracted position and a deployed position.

1 15. The method of claim 14, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating an actuator
3 coupled to a proximal end of the deployment controller.

- 1 16. The method of claim 14, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating the deployment
3 controller, the deployment controller being configured to guide the needle carrier along a path
4 that includes a proximal curved path segment leading initially away from the elongate body
5 member and then toward the elongate body member.
- 1 17. The method of claim 13, further comprising placing a suturing instrument enclosing a
2 second forward-deploying needle carrier including a needle, wherein the second forward-
3 deploying needle carrier is movably positioned within a needle carrier channel adjacent the tissue
4 to be sutured.
- 1 18. The method of claim 13, wherein placing a suturing instrument enclosing a forward-
2 deploying needle carrier further comprises associating a suture with said needle.
- 1 19. The method of claim 13, wherein the needle carrier follows a path including a distal path
2 segment, the needle being intercepted by the catch as the needle carrier traverses the distal path
3 segment.
- 1 20. A method for shortening the pelvic floor comprising the steps of:
2 placing a suturing instrument enclosing a forward-deploying needle carrier including a
3 needle adjacent to the tissue of the pelvic floor;
4 deploying the suturing instrument such that the suture is passed through the tissue of the
5 pelvic floor; and
6 tightening the suture such that the pelvic floor buckles and is effectively shortened in height.
- 1 21. The method of claim 20, further comprising a second deploying of the suturing
2 instrument such that the suture is passed through the tissue of the pelvic floor prior to tightening
3 the suture such that the pelvic floor buckles and is effectively shortened in height.
- 1 22. The method of claim 20, wherein the suturing instrument comprises:
2 an elongate body member;
3 a needle deployment system disposed at a distal portion of the elongate body member, the
4 needle deployment system comprising the forward-deploying needle carrier; and
5 a catch disposed on the elongate body member to receive and retain the needle.

- 1 23. The method of claim 22, wherein the suturing instrument further comprises:
2 a deployment controller having a distal end, the deployment controller extending
3 substantially along a longitudinal axis of the elongate body member to the distal portion of the
4 elongate body member, the distal end of the deployment controller being coupled to the needle
5 carrier to facilitate movement of the needle carrier between a retracted position and a deployed
6 position.

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